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FARMERS' BULLETIN 1073
UNITED STATES DEPARTMENT OF AGRICULTURE

GROWING BEEF ON THE FARM



SOME of the most essential items in growing beef on the farm are:

- First. Plenty of pasture and feed.
- Second. The right kind of cows—those that will produce good calves regularly.
- Third. A good, purebred registered bull—one that will sire good calves persistently.
- Fourth. A large calf crop. This means that all cows shall drop calves, and that the calves shall be properly cared for at birth.
- Fifth. Proper care of the breeding herd and the calves.
- Sixth. Selection of good heifer calves to replace old or inferior cows.
- Seventh. Prevention of disease among the breeding herd and the younger stock.
- Eighth. Shelter sufficient to protect the cattle from both severe cold and extremely hot weather.
- Ninth. A practical knowledge of fattening cattle for market.
- Tenth. Marketing to advantage.

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GROWING BEEF ON THE FARM.

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ESSENTIAL ITEMS.

THE successful production of beef calves, and their development into profitable animals, whether for stockers, feeders, or finished animals for slaughter, is a phase of the beef-cattle business that concerns beef producers everywhere.

Closely associated with the growing, feeding, and successful handling of the calves, and which also determine largely the profit or loss from the business, are the selection of the breeding herd and the feed, care, and management given it.

This publication is intended to give in a general way the practices which successful breeders and feeders of beef cattle have found most profitable and which experiments have proved to be most reliable.

SELECTING THE COW HERD.

If a good cow, bred to a good, purebred bull, will produce a good calf, a better cow bred to a better bull will produce a better calf. With that idea clearly in mind, cows to be used in a breeding herd may be selected with a considerable degree of confidence. While the selection may need to be made from among native or high-grade cows, yet the type of cow most desired is the useful kind.

It is advisable frequently for the beginner with little experience in handling or caring for beef cattle to select the most useful type from the cows available. As a rule it pays to start with as good foundation cows as possible, although the experience of the individual, as well as capital and available equipment, are points which should naturally help decide. While there may be differences of opinion as to the type of cows to select, whether the selection is made from a bunch of natives or of high grades, each cow should be a useful animal.

In either case the cow that proves to be the most useful, consequently the most profitable, is of the large, roomy, vigorous type, possessing a strong constitution as indicated by a wide, deep conformation, with a good chest or heart capacity, strong, clean-cut muzzle, bright eye, and alert but gentle disposition.



FIG. 1.—These grade cows have been carefully selected. Each one produces good calves. The Shorthorn bull shown in figure 6 heads this herd.

Cows of good quality that do well themselves on limited feed rations, as indicated by their uniform fleshings, loose, pliable skin, glossy coat of hair, and are not coarse or rough in any respect, should be selected. Cows of that kind, when bred to the right kind of bull, usually reproduce regularly calves that will develop into good steers. Such cows also usually give sufficient milk to nourish their calves properly. It should be the desire, therefore, of the owner to select, for the breeding herd, cows that when bred to good, purebred bulls will gradually and consistently improve the average of the calves in the herd.

Cows that have proved to be nonbreeders should be eliminated. They should preferably be sent to the butcher to prevent their being resold for breeding purposes. "Shy breeders" also should be disposed of in order that no cow may board at the expense of the others.

HERD MANAGEMENT.

Profitable beef production commercially depends upon the grade-cow herd and the use of a good, purebred bull, managed so that each generation of cows selected is an improvement upon the preceding one. In order that this may be true the best heifer calves should be retained each year to take the place of barren or shy-breeding cows. All other calves produced may be sold either as weanling calves at 6 to 8 months old, as stockers or feeders at 1 or 2 years, or finished as baby beef at from 16 to 20 months, or as fat steers at an older age.

Small farms in a high state of cultivation and where large quantities of feed are produced may be stocked with breeding cows to a maximum carrying capacity and the calves disposed of at weaning time or fattened as baby beef to advantage. In that way practically no cattle other than the breeding herd are maintained, whereas if the calves were carried over as stockers and feeders to older ages more feed and pasture would be required. This practice is often found to be very profitable. If, on the other hand, a limited quantity of feed is produced on a farm of this kind it would be more profitable to sell the calves at weaning time to men who make a specialty of feeding that kind of cattle for the market.

Breeders who operate large holdings where extensive pastures are available and feed enough is grown to carry the calves through winter as stockers often find it more profitable to carry them to an older age so as to market the grass and feed with them and get more weight per head.

If in either case a certain method for disposing of calves is adopted, more than likely it will become necessary to vary from that method occasionally on account of changes in conditions. Unfavorable years for growing feed may make it necessary to sell the calves at weaning time. Also, on farms where it is intended to carry the calves over as stockers, pastures and winter feed crops may be cut short by drought or some other unforeseen condition, making it necessary to dispose of the calf crop earlier than usual.

THREE SYSTEMS IN VOGUE.

The systems of handling beef-breeding herds which are more extensively practiced than any others are "beef," "baby beef," and "dual-purpose." In the first two systems calves run with their dams until weaned, none of the cows being milked. They differ in that cows intended for producing calves for baby beef generally receive better care because their calves are to be fattened shortly after weaning, which makes it necessary to push them as rapidly as possible and to give them a good start.

The straight-beef system is primarily adapted to regions where pasture is plentiful and cheap. This system is more generally practiced in the United States than either of the other two.

The baby-beef system is a highly specialized line and is peculiarly adapted to regions where a plentiful supply of fattening feeds is grown, together with sufficient pasture for the summer maintenance of the breeding herd and nursing calves. At present the corn belt is the most logical region where this system fits in best, but it is practiced in a limited way in other sections.

The dual-purpose system is practised extensively in many semi-dairy districts. In this system all the cows are milked and the calves are raised on skimmed milk and supplemental feeds. Often the dual-purpose idea resolves itself into trying to make dairy animals out of a strictly beef breed. From the standpoint of beef production the dual-purpose system is commendable if adhered to rigidly; otherwise there is little to recommend it. Dual-purpose calves as a rule do not possess the beef-type characteristics of strictly beef-bred calves, but when they are "grown out" and fattened properly they make very acceptable beef.

Double nursing is a modification of the systems described and is very economical when properly applied, but is not practiced very extensively. In this system about half of the cows of the herd nurse 2 calves each and the other half, from which the calves are taken, are milked. This plan works exceptionally well when all the cows in a herd are heavy milkers.

The breeding herd may be so handled that either spring or fall calves are raised. The best time to have calves dropped is a question frequently debated among cattlemen. Some prefer having calves dropped in the spring (late in February, in March, or early in April), while others prefer having them dropped in the fall (September and October). As a rule the question should be decided by individual farm conditions, taking into consideration the feed supply, pasture, equipment, and labor.

When calves are dropped in the spring one wintering is saved; they do not require so close attention during their first winter, when carried over as stockers; cows may be wintered more cheaply by using a greater amount of coarse roughage; less labor is required to handle the calves during the winter and less pasturage is required during the summer, since cows and calves run together.

When calves are dropped in the fall the cows are in better condition at calving time; they give more milk for a longer period; the calves make better use of the grass during their first summer; they escape flies and heat while small, and are weaned at the beginning of calving time.

Other advantages of each method over the other might be mentioned but those given are the most important. In either case the calves should be dropped within a period of not more than 60 days, to give as much uniformity as possible to the calf crop.

For convenience in determining the time the cow is due to calve, the time of service being known, a gestation table is given below, by the use of which it is very easy to determine the approximate time a cow will calve. It will assist in keeping accurate breeding records.

Gestation table for cows (283 days).

Day of month bred.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Explanation: Find date cow was bred in first column and month bred in top line. The date in column below opposite date bred will be the time at which the cow is due to calve.												
1.....	Oct. 11	Nov. 11	Dec. 9	Jan. 9	Feb. 8	Mar. 11	Apr. 10	May. 11	June. 11	July. 11	Aug. 11	Sept. 10
2.....	12	12	10	10	9	12	11	12	12	12	12	11
3.....	13	13	11	11	10	13	12	13	13	13	13	12
4.....	14	14	12	12	11	14	13	14	14	14	14	13
5.....	15	15	13	13	12	15	14	15	15	15	15	14
6.....	16	16	14	14	13	16	15	16	16	16	16	15
7.....	17	17	15	15	14	17	16	17	17	17	17	16
8.....	18	18	16	16	15	18	17	18	18	18	18	17
9.....	19	19	17	17	16	19	18	19	19	19	19	18
10.....	20	20	18	18	17	20	19	20	20	20	20	19
11.....	21	21	19	19	18	21	20	21	21	21	21	20
12.....	22	22	20	20	19	22	21	22	22	22	22	21
13.....	23	23	21	21	20	23	22	23	23	23	23	22
14.....	24	24	22	22	21	24	23	24	24	24	24	23
15.....	25	25	23	23	22	25	24	25	25	25	25	24
16.....	26	26	24	24	23	26	25	26	26	26	26	25
17.....	27	27	25	25	24	27	26	27	27	27	27	26
18.....	28	28	26	26	25	28	27	28	28	28	28	27
19.....	29	29	27	27	26	29	28	28	29	29	29	28
20.....	30	30	28	28	27	30	29	30	30	30	30	29
21.....	31	Dec. 1	29	29	28	31	30	31	July 1	31	31	30
22.....	Nov. 1	2	30	30	Mar. 1	Apr. 1	May 1	June 1	2	Aug. 1	Sept. 1	Oct. 1
23.....	2	3	31	31	2	2	2	3	2	2	2	2
24.....	3	4	Jan. 1	Feb. 1	3	3	3	4	3	3	3	3
25.....	4	5	2	2	4	4	4	4	5	4	4	4
26.....	5	6	3	3	5	5	5	5	6	5	5	5
27.....	6	7	4	4	6	6	6	7	6	6	6	6
28.....	7	8	5	5	7	7	7	8	7	7	7	7
29.....	8	.....	6	6	8	8	8	9	8	8	8	8
30.....	9	.....	7	7	9	9	9	9	10	9	9	9
31.....	10	.....	8	.....	10	.....	10	10	.....	10	.....	10

Spring calves should be weaned before the end of the pasture season in the fall to allow them some time on grass if winter pasture can not be provided. If they are to be finished as baby beef they should go into dry lot at the end of the pasture season and be ready for market the following June or July.

Fall-born calves should be weaned after they have been placed on pasture in the spring, and then a gradually increasing allowance of grain should be given them, with hay and silage added later in the summer. For baby beef they should go into dry lot for finishing at the end of the pasture season, and be ready to market in December or January.

Calves which are not intended for baby beef need not receive grain so early or in so large quantities, because they are making their

growth without fattening. They can utilize much larger amounts of roughages, such as stalk fields, meadows, silage, and straw, with a pound of cottonseed meal as a supplement. A regular fattening ration need not be supplied until the calves are mature.

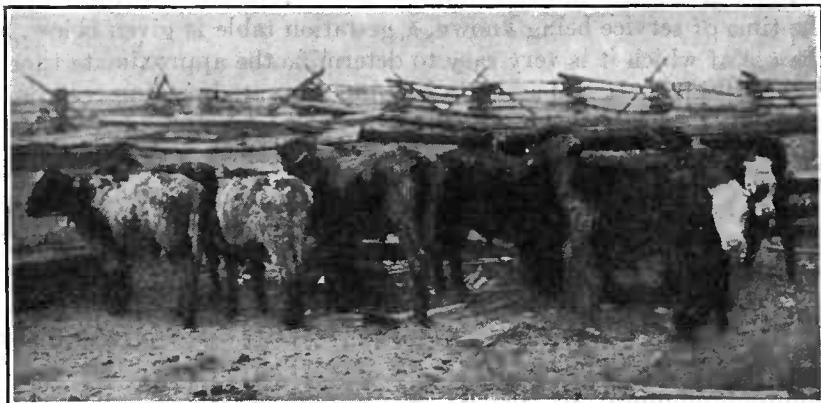


FIG. 2.—Stocker calves ready to go on grass in April after having been wintered on silage and clover hay.

THE KIND OF HERD BULL TO USE.

Buying a good herd bull is the first step in growing better calves at much less cost per pound. In common or native-cow herds, calves sired by purebred bulls weigh on an average about 125 pounds a

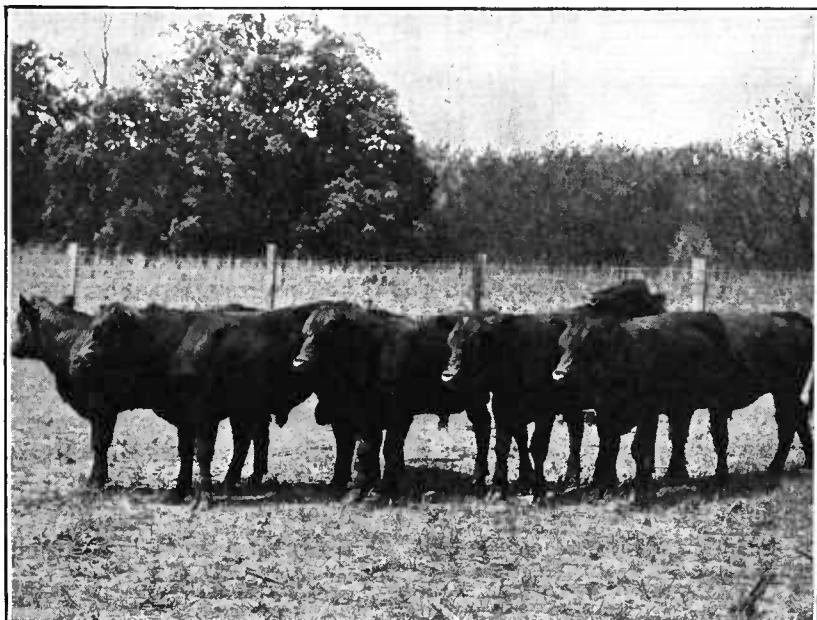


FIG. 3.—The right kind of purebred Angus bull calves from which sires should be selected.

head more when 1 year old than calves of the same age sired by the average run of scrub bulls, and they will sell for about 2 cents a

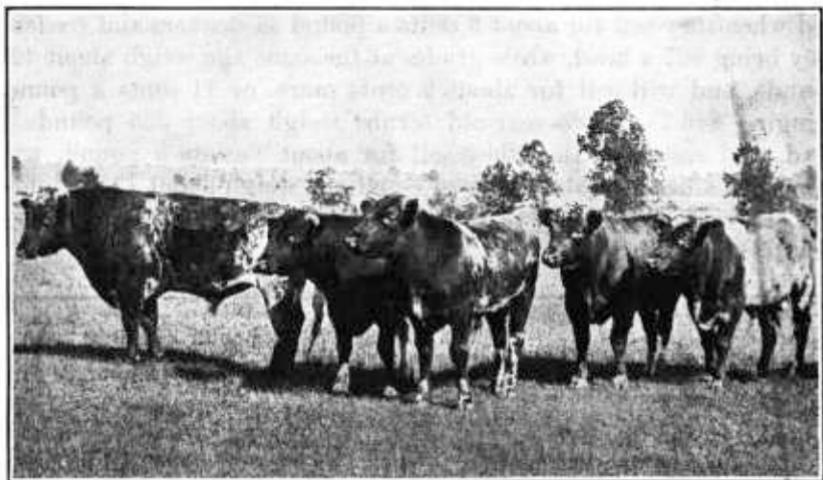


FIG. 4.—The right kind of young, purebred Shorthorn bulls from which sires should be selected.

pound more as stockers and feeders. Two-year-old steers sired by good, purebred bulls weigh on an average about 200 pounds a head



FIG. 5.—The right kind of purebred Hereford bull calves from which sires should be selected.

more than steers sired by scrub bulls, and sell for about 4 cents a pound more as stockers and feeders.

This difference in price of the two classes of calves and steers applies not simply to the difference in weight but to the total weight. For instance, in the case of yearlings, scrubs weigh about 300 pounds, and when they sell for about 9 cents a pound as stockers and feeders, they bring \$27 a head, while grades at the same age weigh about 425 pounds, and will sell for about 2 cents more, or 11 cents a pound, bringing \$46.75. Two-year-old scrubs weigh about 525 pounds a head, and assuming that they sell for about 8 cents a pound, will bring \$42 a head, while grades of equal age weigh about 725 pounds, and at 4 cents more a pound (about 12 cents) as stockers and feeders, bring \$87.

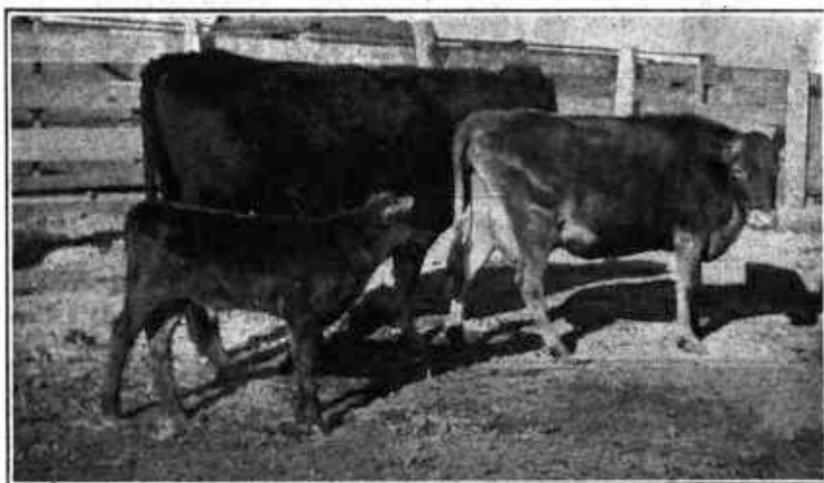


FIG. 6.—This is sire, dam, and their offspring. The purebred Shorthorn bull is being used in a grade-cow herd. He sires the good kind. This Jersey cow is kept on this farm for milk only, but is bred to the beef bull and produces fairly good beef calves.

A still more interesting story may be told in favor of steers sired by good pure-bred bulls when the two classes are fattened and sold for beef. For instance, throughout the year 1918 scrub steers sold at about 10 to 12 cents a pound, while the better class, or grades, went from 16 to 18 cents. Nor is this all. Two-year-old scrub steers weigh about 525 pounds, and when fed a fattening ration for 120 days they will scale possibly 700 pounds. Two-year-old grade steers weigh about 725 pounds, and after a fattening ration for 120 days they will then weigh about 965 pounds. At 1918 prices the fat scrubs would sell for about 12 cents a pound and the fat grades for about 16 cents, the scrubs bringing \$84 a head and the grades \$154.40.

These figures show a difference between the values of the two classes of yearlings and two-year-olds as stockers and feeders, and of fat steers, respectively, of \$19.75, \$45, and \$70.40 in favor of those sired by a good pure-bred bull.

There is practically no difference in the cost of feed for the two classes of calves up to the yearling age, but from that time on grades develop more capacity and require more feed than scrubs. The difference in cost of feed, however, is a very small item when the values are taken into consideration.

The big difference lies in the kind of bull used.

CARE AND FEED FOR THE BULL.

The bull should be the best-cared-for individual in the herd. Not only should he have special feed at times but he should be kept in a separate paddock or lot and should not have the freedom of the herd except during limited seasons of the year. Unless a special lot can be provided, some means of giving the bull exercise should be devised.

The bull should be well fed during all seasons of the year, but especially so just previous to the breeding season. The bull's ration may consist of roughages mainly, but a small quantity of grain also should be used.

The exact quantities of feeds that should be given depend largely upon the size, age, and individuality of the animal, and the ration must be varied according to requirements. As a general rule excessive quantities of silage should not be fed to a bull doing heavy service. A safe rule to follow is to feed one-half as much silage as would constitute a full ration for an average cow.

CARE OF THE NEWBORN CALF.

If the breeding cows are in a vigorous, healthy condition at time of calving they will probably need little, if any, assistance. While it is true that most calves born need no assistance whatever, yet it is true also that many that die would have lived had they had assistance at the proper time. As soon as the calf is born it should have the fetal membrane removed from its nose and mouth at once. Unless the calf is strong and vigorous, insert a finger into the mouth and give the tongue a slight pull. Pressure on the ribs may be necessary sometimes to stimulate breathing. Allow the cow to dry and care for the calf alone. Afterwards the calf may need some assistance to find the udder. The calf should get the first milk—the colostrum—which acts as a mild purgative unless the cow's udder is feverish.

The calf should make fast continuous growth from time of birth. A common expression among beef-cattle growers is, "Keep the stomach of the calf full of milk and grain at all times." Give it all the milk from its dam, for a short period at least, unless too much milk is produced.

FEEDING AND RATIONS.

FEEDING CALVES.

The success of growing cattle for market depends to a large extent upon the start which is given the calves. This, aside from the calf's breeding, is probably the most important consideration. Without the proper breeding a choice steer is rarely if ever produced, but the same is equally true of the feed and early care of the calves. No matter what system of breeding is practiced, the calves should have the best possible start. In straight beef production only a small quantity of feed in addition to milk is needed for the calves up to wean-

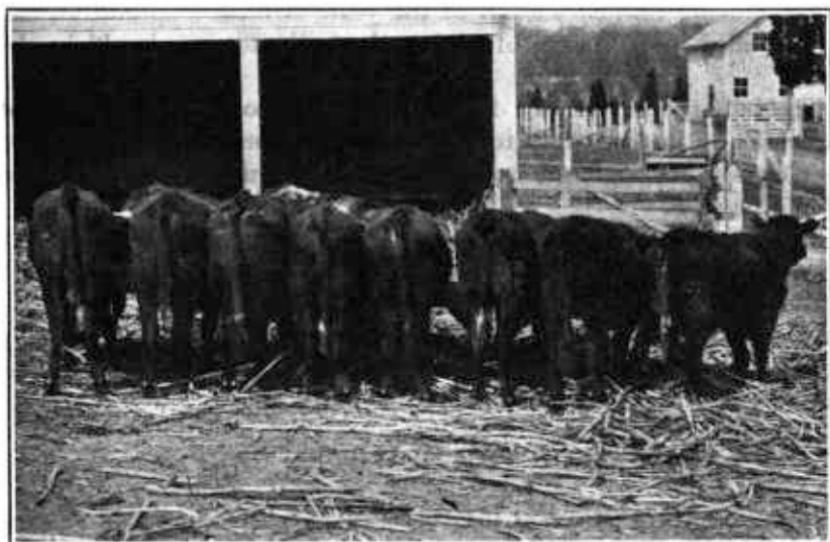


FIG. 7.—Good, two-year-old grade feeders. Their first day in the feed lot to be fattened. Average weight, 773 pounds.

ing time, but nevertheless they should be taught to eat grain and hay so that the transition during weaning will not result in loss of flesh.

When calves are intended for baby beef they should be started on some grain when between 4 and 6 weeks old. A mixture of equal parts, by weight, of shelled corn, whole oats, and wheat bran is satisfactory. The corn and oats may be fed ground until the calves become accustomed to eating; then they may be fed whole. When fed whole they are less likely to cause scours. The grain allowance should be increased gradually up to weaning time so that the lack of milk will not hinder growth and fattening. In other words, calves intended for baby beef should be kept on full feed from the time they are started on a supplemental ration until they are sold.

Calves from cows that are milked should be taught also to eat supplemental feeds within a few weeks after birth. The quantity of

grain and hay consumed at first necessarily will be limited, but should be increased gradually until the calf can do without milk when from 6 to 8 months old. Fall calves that are fed skim milk and supplemental feeds during the winter months put on very good gains on pasture the following summer.

The protein requirements of the growing calf should be amply supplied. After weaning, legume hays and silage may form the greater part of the roughage and one-half to three-fourths of a pound of cottonseed meal or linseed meal given in addition to grain. The grain ration may be increased gradually until the calves are receiving a fattening ration.

Calves that are to be finished on pasture may be handled in about the same way as those to be fattened in the dry lot. The grain allowance may be smaller at first but after the calves are turned on pasture it should be increased as they become able to utilize greater quantities of concentrates.

Calves that are to be "fed out" as long yearlings or two-year olds or sold as stockers and feeders may be fed considerably more cheaply during the first winter. The winter ration may consist principally of silage and cheap roughages, but some concentrates should be used to keep the calves growing and in a thrifty condition. They should be run on pasture the following summer and sold in the fall as feeders or fattened out the following winter as long yearlings. If it is desired to keep them longer, the cattle may be "roughed" through a second winter and fattened the next year.

FEEDING THE COW HERD.

When feeds are high in price the use of cheap rations is especially desirable for the maintenance of the breeding herd. Cows raised for the production of calves only can be fed very cheaply on silage and dry roughages combined with a small quantity of protein-rich concentrates. By the use of leguminous roughages the protein-rich concentrate may be omitted.

Dual-purpose cows kept for dairy products as well as calves should receive feeds nearly identical with those for dairy cows, for best results. Considerable quantities of concentrates must be used if the cows are to produce the maximum of dairy products. The cost of the feeds in the ration should be considered and home-grown feeds utilized whenever possible. Cows that are milked should receive 1 pound of concentrate for every 3 to 4 pounds of milk produced, depending upon the fat content of the milk. This is the customary grain allowance and is satisfactory.

The purchase of feeds is not to be discouraged but should be reduced to a minimum. A successful cattle raiser must grow the necessary roughages and not rely upon their purchase.

During the summer months the cow herd should be maintained largely on pasture. Should the pastures become very short a supplemental feed should be provided. This can best be supplied by silage if available; otherwise forage crops, or even hay, may take its place. In the fall the cows may be maintained on meadows and aftermath, and later in the fall on stalk fields in regions where a considerable part of the corn crop is not cut or used for silage.

In the South, where velvet beans may be grown, this crop when planted with corn affords excellent pasturage for breeding cows after the corn has been gathered.

In the great range sections of the Southwest droughts are quite frequent, and range cattle often suffer and many die from starvation. During such periods a great deal of feed must be supplied or many cattle may be lost. Unfortunately, in those sections provision is seldom made in advance to help out during dry seasons. Cottonseed meal or cake usually can be shipped in, but concentrated feeds do not supply the necessary roughages, and the high cost of transportation makes it impracticable to ship in bulky roughages. To overcome the difficulty during the last severe drought many cattle owners utilized the native range plants, such as soap weed, sotol, bear grass, and prickly pear. These plants, ground up, serve to sustain the life of cattle when each mature animal receives from 20 to 25 pounds a day. When from 1 to 2 pounds of cottonseed cake are given in addition to the chopped feed a fairly good ration is provided.

In the semiarid regions of the Southwest, if suitable crops can be raised, silos may be used to advantage. One of the numerous kinds of sorghum plants may be grown for silage and fed to the cattle during periods of feed scarcity. In many places the pit silo can be used. Information concerning the construction of this and other kinds of silos may be found in Farmers' Bulletins 825 and 855, which can be obtained free on applying to the Department of Agriculture, Washington, D. C.

In the range sections of the Middle West the winters are very severe, and often when there is a shortage of feeds cattle losses are heavy. In most of these sections provision can be made for the growing of winter feeds. On many ranches a part of the range is fenced off and crops grown for winter feeding. At least some hay should be put up and used as emergency feed. During severe winters animals that are especially thin and weak should be separated from the rest of the herd and sheltered and fed. Cheap shelter not only saves feed but may save many cattle that would die if left exposed to wintry storms. Briefly, it is most important that some provision should be made to carry the cattle through periods of feed shortage so that losses are reduced to a minimum.

For the reader's convenience in working out winter rations for breeding cows in various sections of the country the United States has been divided into several sections, viz, Far West or Coast, Western Range, Southwestern, the Corn Belt, East, and Southeast, and a few general rations prepared for each. These rations are only suggested and must be varied according to local conditions.

The rations suggested are per thousand pounds of live weight and are only for beef cows in calf. Cows that are producing milk should have considerably more concentrates for best results.

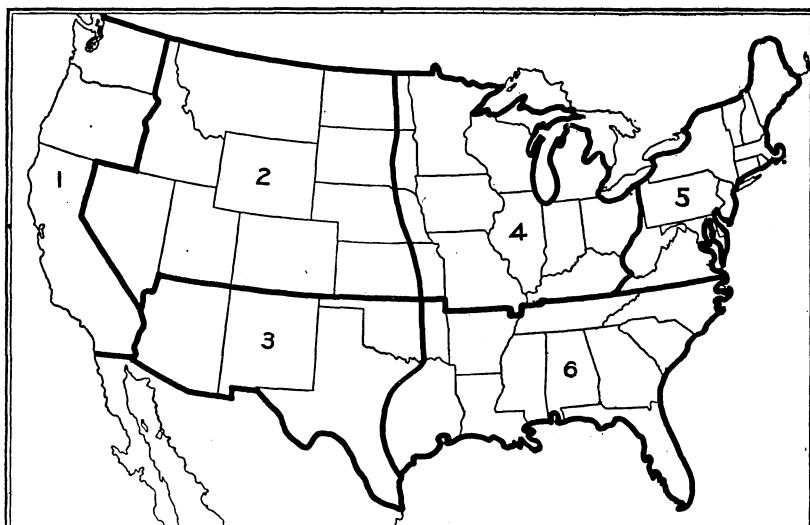


FIG. 8.—Sections of United States: (1) Far West, or Coast, section. (2) Western Range section. (3) Southwestern Range section. (4) North Central, or Corn Belt, section. (5) East, or Atlantic Coast, section. (6) Southeast, or Cotton, section.

RATIONS FOR WINTERING COWS IN VARIOUS SECTIONS.

FAR WEST, OR COAST, SECTION.

Ration 1.	Pounds.	Ration 4.	Pounds.
Oat or barley hay-----	10	Sugar-beet pulp-----	40
Corn silage-----	30	Alfalfa hay-----	5
Barley-----	2	Corn stover or cereal hay-----	10
Ration 2.		Ration 5.	
Corn silage-----	40	Alfalfa hay-----	5
Alfalfa hay-----	5	Oat or barley hay-----	20
Straw-----	Unlimited	Straw-----	Unlimited
Ration 3.		Ration 6.	
Alfalfa hay-----	10	Mixed or grass hay-----	15
Cereal straw-----	15	Alfalfa or clover hay-----	5
Barley-----	1	Barley-----	2

WESTERN RANGE SECTION.

Range with supplementary feeds during severe storms or periods of feed scarcity. From 8 to 10 pounds of native hay or alfalfa, if it can be grown, per head per day in addition to the range will aid materially in reducing winter losses.

SOUTHWESTERN RANGE SECTION.

Range with the use of emergency feeds during periods of feed scarcity. In the semiarid sections from 20 to 25 pounds of silage and from one-half to 1½ pounds of cottonseed meal a day would serve as a suitable ration. In the more arid sections 20 to 25 pounds of chopped prickly pear, sotol, soap weed, or bear grass, and from 1 to 2 pounds of cottonseed cake or meal will save the cattle from starvation.

NORTH CENTRAL, OR CORN BELT, SECTION.

Ration 1.	Pounds.	Ration 3.	Pounds.
Corn silage	35	Corn silage	40
Corn stover	10	Straw	5
Cottonseed meal or oil meal	1	Oil meal or gluten feed	¾
Ration 2.		Ration 4.	
Alfalfa or clover	10	Corn silage	35
Corn stover or straw	15	Clover hay	10

EAST, OR ATLANTIC COAST, SECTION.

Ration 1.	Pounds.	Ration 3.	Pounds.
Corn silage	35	Corn silage	40
Corn stover	10	Straw	5
Cottonseed meal or oil meal	1	Oil meal or gluten feed	¾
Ration 2.		Ration 4.	
Alfalfa or clover	10	Corn silage	35
Corn stover or straw	15	Clover hay	10

SOUTHEAST, OR COTTON, SECTION.

Ration 1.	Pounds.	Ration 4.	Pounds.
Corn silage	35	Sorghum silage	40
Cottonseed hulls or straw	10	Velvet beans (seed and pod)	2
Cottonseed meal	1½	Lespedeza hay or peanut-vine hay	5
Ration 2.		Ration 5.	
Corn stover, coarse hay, or straw.	Unlimited.	Grass hay	15
Cottonseed cake	2	Velvet beans (seed and pod)	4
		Straw or stover	5
Ration 3.		Ration 6.	
Alfalfa	5		
Corn silage or sorghum silage	40	Velvet-bean and cornstalk fields.	

RATIONS FOR WINTERING STOCKERS.

STOCKER CALVES.

Ration 1.	Pounds.	Ration 5.	Pounds.
Corn or sorghum silage-----	15	Corn or sorghum silage-----	15
Alfalfa, clover, soy bean, or cow-pea hay-----	4	Timothy, rye, or mixed hay or stover-----	6
Ration 2.		Cottonseed meal or oil meal-----	$\frac{1}{2}$
Corn or sorghum silage-----	15	Ration 6.	
Oat, rye, or wheat straw-----	8	Corn or sorghum silage-----	15
Cottonseed meal or oil meal-----	1	Oats -----	3
Ration 3.		Cottonseed meal or oil meal-----	$\frac{1}{2}$
Corn or sorghum silage-----	10	Ration 7.	
Lespedeza hay -----	3	Lespedeza or pea-vine hay-----	10
Oat or wheat straw or stover-----	3	Straw, stover, or grass hay-----	5
Cottonseed meal, oil meal, or peanut meal-----	1	Cottonseed meal, oil meal, or peanut meal-----	1
Ration 4.		Ration 8.	
Corn or sorghum silage-----	15	Velvet bean and stalk fields if beans are plentiful.	
Lespedeza or pea-vine hay-----	10		
Velvet beans in pod-----	4		

These rations are satisfactory for wintering 400 to 450 pound calves as stockers. They should be adjusted to suit local conditions, however, and to meet the needs of specific bunches of calves. Other feeds not given here may be substituted for similar feeds given.



FIG. 9.—Yearling stockers ready to go on grass in April after having been wintered on silage, cottonseed meal, and straw.

YEARLING STOCKERS.

Yearling stockers may be wintered on the same feeds used for wintering stocker calves by increasing the amounts in the ration. Approximately the ration for a stocker calf weighing 450 pounds

should be increased by about one-half for a stocker yearling weighing 725 pounds, depending of course upon the individuality of the animal.

In the range sections of the United States stocker calves and yearlings should be fed from 1 to 3 pounds of some concentrate, as cottonseed or oil cake, in addition to pasture, except in severe weather, when they should also have roughage.

RATIONS FOR FINISHING CALVES FOR BABY BEEF.

The following rations may be used as the average amount of feed per head per day for calves weighing 450 to 500 pounds which are to be finished for baby beef. The rations may be adjusted to suit local conditions under which they may be used, if desired. This may be done by substituting one or more local or home-grown feeds, as the case may be, for some feed or feeds of the same general character included in the rations as here outlined.

Ration 1.		Ration 6.	
	Pounds.		
Silage	12	Silage	12
Clover hay	3	Lespedeza hay	3
Cottonseed meal	2	Cottonseed meal	2½
Corn	10	Corn	10
Ration 2.		Ration 7.	
Silage	10	Silage	10
Alfalfa hay	3	Cowpea hay	5
Oil meal	2	Cottonseed meal or peanut meal	2
Corn	10	Corn	8
Straw	Unlimited		
Ration 3.		Ration 8.	
Silage	8	Silage	12
Corn-and-cob meal	15	Cottonseed meal or oil meal	2½
Clover or alfalfa or lespedeza or cowpea hay	4	Kafir or milo chop	12
Cottonseed meal or oil meal	2		
Ration 4.		Ration 9.	
Cowpea hay	10	Corn	5
Corn	6	Molasses	2
Cottonseed meal	3	Cottonseed meal	2
Coarse hay or straw	Unlimited	Mixed hay	Unlimited
Ration 5.		Ration 10.	
Silage	10	Barley	10
Cottonseed meal	2	Beets or roots	10
Whole velvet beans (soaked)	4	Clover or alfalfa hay	6
Corn	8	Coarse hay	Unlimited

DISPOSING OF STOCK PRODUCED.

The manner of disposing of the stock produced, or the surplus, will vary according to the method of handling the herd and the locality in which they are produced. Some farmers may profitably

feed their young stock for market as baby beefes while others may realize more profit by selling the surplus as milk-fat weanlings, or as yearlings, or 2-year-olds.

Whether to feed calves as baby beefes depends largely upon the quality of the calves, the availability of fattening feeds, and the farmer's knowledge and ability to feed that class of cattle. For baby beef a superior grade of calves is required and in order to make satisfactory gains they must receive more attention than older cattle.

Calves will produce more gains for each 100 pounds of feed consumed than older cattle will, but older cattle are somewhat easier to feed and can utilize large quantities of roughages which otherwise



FIG. 10.—Two-year-old steers weighing about 1,000 pounds, just turned to pasture on the first of May to be fattened out by fall with cottonseed cake and grass.

might be wasted. They also require less shelter than calves and can be fattened within a shorter time.

In most sections of the United States good pastures, if properly used, give the cheapest feed for cattle and should be utilized for fattening whenever possible.

If started on feed late in winter or early in spring fattening cattle may be turned on pasture after grass has made a good growth, in which case grass should be supplemented with concentrates. If a heavy feed of silage has been fed in a ration, cattle on full feed may be turned on grass with no serious effects from scouring as a result of the change from silage to grass, but cattle on a full ration of dry feeds scour when first turned on grass, and unless they remain on pasture for several weeks the losses caused by scouring may be greater than the benefits derived from the grass. Scant pastures

should never be used for finishing fattening cattle, especially if they have the run of a large area. If the animals are not able to get a good bite at each swath they may take so much exercise in getting a fill that their gains will be materially reduced.

The choice between selling steers as feeders and fattening them for market should be determined by such factors as the cost and availability of feeds for fattening and the market price for feeders. When a farmer has an abundance of pasture and cheap roughage with a limited quantity of fattening feeds the most economical disposition of the surplus stock may be to sell it as stockers or feeders; but for those farmers who have the feed to finish their cattle fattening for market may prove to be the most profitable practice. In feeding cattle not all the profits are received from sales of fat steers. The increased fertility of the soil represents an important part of the profits.

HOGS FOLLOWING STEERS.

Stocker cattle usually are not fed sufficient grain to make it worth while to have hogs follow them, but cattle that are being fattened for market usually receive so large a proportion of concentrates that considerable feed is voided in the manure. Such waste feed can profitably be converted into pork by letting a few hogs follow the cattle.

The number of hogs to use depends upon the kind of cattle and the character and quality of the concentrates. Old cattle pass more undigested feed into the manure than young cattle do. Also, the waste feed is considerably greater when whole grain is used than when the grain is ground. Ordinarily one pig weighing 70 or 80 pounds to each 3 steers will be required. When supplemental feed is given the pigs, a few more may just as well be added. The chief consideration is to utilize all waste feed and convert it into pork.

EQUIPMENT FOR FEEDING AND SHELTER.

The equipment necessary to raise beef cattle depends largely upon the section of the country and the system of breeding. Ordinarily, under range conditions where the cows drop their calves in the spring, very little shelter is necessary, but some shelter, such as inexpensive open sheds, is highly desirable. Where the cows drop calves in the fall or winter, or where the cows are milked, shelter is an absolute necessity.

Equipment for the feeding of steers need not represent a large outlay of money, but the bunks, sheds, and water supply should be so arranged that the feeding may be performed with as little labor as possible. Convenience should be the first consideration in the arrangement of sheds, feed lots, and pastures.

DEHORNING AND CASTRATION.

All calves should be dehorned and the males castrated. The two operations may be performed at the same time and it is often advisable to do so in order to save time. They should be performed before the calves are weaned. Thrifty nursing calves withstand these operations with very little setback, while this may not be true of older animals. The operations are rather simple and with reasonable precautions any cattle raiser should be able to perform them safely.

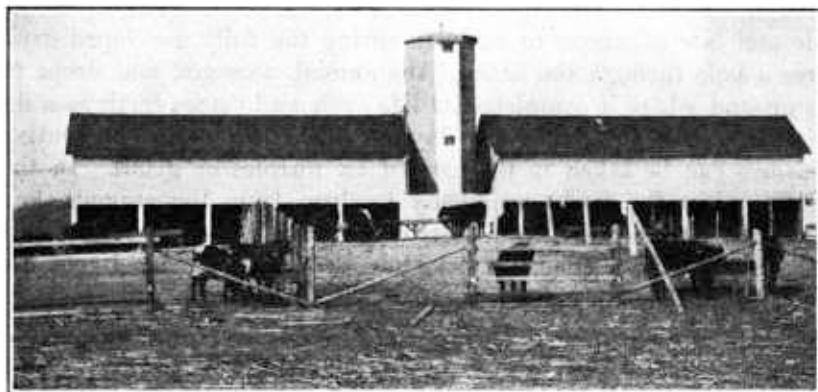


FIG. 11.—Steer-feeding shed with south-side exposure, permitting plenty of sunshine. The mow space holds considerable hay or other dry roughage.

PARASITES AND DISEASES AFFECTING CALVES.

Several animal and vegetative parasites prey upon cattle, the more common of which are Texas-fever ticks, lice, screw worms, the ox warble, and mange.

The Texas-fever tick.—This pest, which only a few years ago was prevalent throughout all the Southern States, is rapidly being eradicated. It causes injury to cattle through sucking their blood, thus weakening them, and also by transmitting protozoa, a low form of animal life, which live upon the corpuscles of the blood, resulting in a high fever which frequently terminates in death. The disease can be combated most successfully by the periodic use of arsenical dips which destroy the ticks.

Cattle lice.—These are animal parasites which do most damage during the winter months. Poor, run-down cattle seem to be affected the most. Lice can be disposed of best by dipping the cattle in coal-tar dips in the fall before cold weather sets in. The dipping should be repeated within a week or 10 days to kill the lice which may have hatched from the eggs or nits deposited on the hair of the animal at the time of the first treatment. Dipping is ad-

visible in large herds, but in small herds lice can be killed by the application of a suitable spray mixture with a small spray or brush.

Screw worms.—During the hot months screw worms do their damage by getting into wounds, cuts, or sores and burrowing in and feeding on the flesh. The eggs are laid in the wounds by the adult fly and develop into the screw-worm larvæ, which do the damage. Screw-worm infestations may be effectively treated by opening the wounds and washing them out with gasoline and treating them with pine tar to prevent further annoyance.¹

Ox warbles or grubs.—These pests cause damage by boring holes through the hide. During the winter, enlargements form under the hide and late in winter or early in spring the fully developed grub bores a hole through the hide of the animal, emerges, and drops to the ground where it completes its life cycle and comes forth as a fly to start a new generation by laying eggs. No really preventive measures can be taken in the case of ox warbles or grubs. In the spring, when the grubs are ready to drop from the animal, they should be squeezed out and destroyed. This can be accomplished easily at the proper time and the grubs that are not ready to emerge can be dislodged by making a small slit in the hide with a sharp knife.

Cattle mange.—This is caused by a small mite which attacks the skin and causes it to become scurfy. Mange spreads from one animal to another by contact, which may transmit the mites. It can be remedied by dipping or by the application of a dip solution with a small spray or brush.

Ringworm.—Of the diseases caused by vegetative organisms, the ringworm and the true bacterial diseases are the most common. Ringworm is very similar to cattle mange but is caused by a vegetative parasite and affects the skin and hair of the animal. The symptoms of ringworm are circular, scurfy patches on the skin. The disease is very common during the winter and spring months. It is found mainly on the heads and necks of the animals, but may affect any part of the body. It causes severe itching and is an annoyance to a calf. To treat this disease scrape off the crusts and wash with soap and water, after which apply tincture of iodin and nitrate of mercury ointment once a day. Carefully whitewash and disinfect the barns, because the disease is contagious and is easily transmitted from one animal to another.

Blackleg.—Of the true bacterial diseases blackleg is probably the most common among calves. It affects cattle 6 months to 2 years old. Sucking calves are seldom affected. Blackleg is believed to be caused by infections through barbed wire cuts or other wounds. The most

¹ For more detailed information concerning screw worms, see Farmers' Bulletin 857, *Screw Worms and Other Maggots Affecting Animals*, prepared by the Bureau of Entomology.

important symptom of the disease is the formation of tumors or swellings under the skin. When the swellings are handled a peculiar crackling sound is heard, caused by the collection of gas under the skin. After an animal has become affected with blackleg very little can be done to save its life. Vaccinating calves while still healthy to prevent them from contracting the disease is the only satisfactory way to reduce blackleg losses. The calves should be vaccinated when about 6 months old and again within 6 months.

